What Else Can We Do With Vegetables

Four Regional USDA Laboratories Will Search Out New Industrial Uses for Vegetables and Other Agricultural Products

by
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IN this land of plenty the situation frequently develops that the plentifulness is overdone. Too much of a given commodity is produced and prices become ruinously low.

In 1938 Congress decided to do just what many industries have done when they found they had on hand a waste product or a byproduct or a surplus of any sort —go to work and find a new use for it. With this principle in mind, Congress established the four Regional Research Laboratories for work on agricultural products.

Problem of Surplus Crops

For many years, and especially during the last few, the Department has been deeply concerned with the problem of surplus crops. Among the agricultural products that have had, with a recurring frequency, the tendency to be produced in surplus quantities are cotton, wheat, corn, peanuts, sweet potatoes, tobacco, fruits and vegetables, milk products, and alfalfa. The searching for new and wider industrial outlets and markets for farm products through research is just one of the several lines of attack on our national farm problem. This means not simply research on specific problems as they arise, but a comprehensive, concerted, closely-knit, aggressive program of research—chemical, physical, technological, and economic—all carried on with the specific aim of finding new and extended uses for farm commodities.

After a careful survey, four laboratory sites were selected. The Western Regional Laboratory is located near San Francisco; the Southern at New Orleans; the Northern at Peoria, Illinois; and the Eastern at Wyndmoor, just north of Philadelphia. Building operations were begun last summer and they will be completed some time this summer.

Soybean flakes which have been freed from oil are ready to be made into a plastic material by the use of chemicals, pressure and heat at USDA Laboratory.

The third step in the organization of the laboratories was to assign particular commodities to each of the laboratories. The Northern Laboratory was given wheat, corn, and agricultural wastes, particularly straw, corn stalks, and cobs. To the Western Laboratory was assigned fruits, vegetables, white potatoes, wheat, and alfalfa. The Southern Laboratory will work on cotton, peanuts, and sweet potatoes. To the Eastern Laboratory was assigned apples, tobacco, milk, white potatoes, vegetables, and animal fats.

This is a formidable and disturbing list. It includes all that we smoke, almost all that we eat, and a good deal of what we wear. We can't export as much as we would like—we can't eat any more—we can't stop growing them, in most cases—but, as one man put it, while the human stomach is limited in capacity, the industrial stomach is never full. One answer, therefore, to the question of surplus commodities is to attempt to divert them to industrial uses.

A consideration of the potential value of vegetables as raw materials for industrial utilization indicates that their value at present is largely in the food field. Their food values, in general, are not so much dependent upon their content of energy-producing substances as on their flavor, vitamin values, food accessories, minerals and bulky residues. Therefore, the most promising type of research to be inaugurated on vegetables under this project should deal with improvements and refinements of processing these perishables as food materials and in profitably utilizing the wastes and culls which arise in their processing. On the other hand, enough has already been accomplished in the non-food field to show that careful research may disclose substances in vegetables which may have important industrial uses. Research in this direction is badly needed.

Frozen Pack Vegetables

Commercial frozen pack of vegetables for domestic and institutional use has been in existence for not much more than ten years, but the estimated commercial pack of the country in 1938 totaled over 84 million pounds. Frozen pack is much more than merely another method of food preservation. It presents new concepts in the distribution and marketing of perishable agricultural commodities, essentially in the fresh state and ready to use. Furthermore, the culls and wastes derived from the production of frozen vegetables are retained at production and processing centers for utilization there in the manufacture of other useful products, as farm feeds or ensilage, or as sources of soil-improving materials.

So young an industrial activity naturally has many technical problems pressing for solution, and possesses at its inception little in the way of experience or technical facts essential to safe, orderly and economical development. There is an urgent need for research to guide conservative development.

NATIONAL Seedsman
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EVERY issue of NATIONAL SEEDSMAN has presented field views and closeups of new and popular varieties of garden and flower seeds. Field seeds and grasses have also been liberally covered when pictures of an exceptionally good field or a profitable strain were available. This has been done in an effort to emphasize how careful the grower tries to be in the selection, breeding and growing of his stock seed, this in order that he may deliver to his dealer customers the quality of seed which the ultimate consumer demands.

No single item in any progressive industry plays a more important part in the advancement of that industry than its raw material, and in the seed trade that raw material is the grower's stock seed. Many among our thousands of dealer readers know this—to the gratification of those growers who spend much of their time, effort and money in breeding plots and trial grounds.

A DRIVE of nearly nine thousand miles during the last six weeks has brought us into a few of the country's western seed production areas. We have been in those sections many times in the past, but never before at harvest time. For that reason we have never fully realized the astounding amounts of money spent each year for the installation of new, modern cleaning equipment, the building of new plants and warehouses and the rebuilding of old seed houses. The cost of such improvements to growers of the central and western seed production states this year runs into staggering figures.

Why is this necessary?

Because the same growers who have strived for years to produce in their fields steadily improved varieties and strains realize that another feature is of almost equal importance to their stock seeds and their field work if quality is ultimately to reach the consumer.

This is the problem of handling the seed after it is harvested and includes such items as threshing, cleaning, refining, warehousing, and the matter of financing those operations. This latter worry often must be overcome before payments for the preceding crop have been fully made to the grower by the dealer trade. In other words, it often happens that the grower is carrying the financial burden of the entire current crop, plus a large part of the previous crop.

A PERUSAL of the picture pages of this issue will give a little idea of the thoughts we are trying to transfer to paper. But remember, please, that while we can reproduce only a couple of dozen views, plants similar to those shown exist by the hundreds. Commenting on the same subject, our friends, the **Nurseryman and Seedsman** of London, recently said that the responsible seed grower's organization was a colony of experts who sponsored their product and took elaborate precautions to preserve and improve their existing stocks. This called for the installation of costly scientific equipment, unerring discrimination, meticulous care, exhaustive knowledge and experienced judgment.

As retail dealers and mail order seedsmen of the highest type in the world, do we here in the United States sufficiently appreciate the efforts made in our behalf by the growers from whom we everlastingly demand more and more of quality and service? Or are we inclined to expect these growers to offer their products in competition with merchandise carrying a lower price?

Many seedsmen would greatly enhance their business education if they could make, in 1941, two trips into the seed producing areas—the first during the growing months and the second immediately following the harvest.

Sugarcane bagasse, straw and corncobs shown with plastic materials they are converted into.

Many vegetables have unique flavors desired for soups and for condiments in general. Only to a limited extent, however, have they been used for producing beverage juices, flavoring extracts and concentrates. With the exception of tomato juice, not more than ten companies are canning vegetable juices, and most of this is sauerkraut and carrot.

With proper technology for producing appealing, nutritious vegetable juices, either singly or in blends, large quantities of vegetables could be utilized. Concentration by evaporation or freezing would yield a compact product suitable for soups and flavoring materials. Most of the nutrients in the vegetable occur in the juice, and hence the latter could well be used by people who cannot tolerate the fibrous material of the whole vegetable. In short, the complete technology of preparation should be perfected and possible markets investigated. The successful outcome of such research would permit utilization of considerable quantities of surplus, and possibly even cull, vegetables.

Large Tonnages of Wastes

The commercial production of vegetable crops either for market or for industrial processing involves large tonnages of wastes or discarded materials that cannot go into food channels. Green leafy vegetables must be trimmed and the cull products segregated before shipment to the fresh-vegetable market; root vegetables must be trimmed or topped and the cull material sorted out; and cannery crops must be vined and hulled or sorted and trimmed before processing. Peelings, skins, stems, pods, cobs, seeds and other materials must be discarded in canning and other processing operations before the ultimate consumption of vegetable commodities as food. Vegetable processing wastes are all essentially of a perishable nature and therefore constitute an acute industrial problem of national importance.

Usually, the first thought in connection with any farm food waste is a consideration of its value as a feed for livestock. So long as such material as culls, tops, vines and trimmings remains on the farm, its disposal is entirely a problem of good farm practice. However, when the crop moves to central receiving stations for sorting, trimming, and packing for the fresh market or to canneries, freezing plants, dehydrators and other processing plants, the wastes accumulate with such great rapidity and in such exceedingly large quantities that a satisfactory means of utilizing the wastes is urgently needed.

The solution of the waste utilization problem, particularly in the case of cannery wastes, is becoming urgent since the enactment of recent state legislation. The acuteness of the problem has been increased because these recent laws prohibit pollution caused by dumping these wastes into streams. Legislative agencies, however, have made but little attempt to help processors who have to deal with this type of waste disposal.

A New Source of Profit

The solution has been left largely to the individual offenders, and in many cases no solution has been forthcoming. Many of these private enterprises are not staffed with scientific workers, nor are they financially able and equipped to carry out research along these lines. The Regional Laboratories should, therefore, devote considerable effort to the utilization of processing wastes. If such waste could be returned to the farm in the form of prepared feed or fertilizer, or could be made to yield derivatives of some value, part of the cost of production and handling of the food portion of the crop would be absorbed, or a new source of profit might be developed by diversion to non-food uses. The need for a definitely formulated program in this field is clearly apparent.

The highly perishable nature of processing wastes suggests their suitability for the application of controlled microbiological conversions. An attempt will be made to develop composting processes for the preparation of soil amendments, mushroom composts or special organic fertilizers from certain of the wastes. Other microbiological processes will be employed to produce enzymes and special chemical products which are useful in industry. Chemical and physical investigations will be undertaken in conjunction with microbiological studies to determine the nature and properties of the products produced from the various waste materials and under various environmental conditions.

Although vegetables as a whole are characterized by high water content, the solids present contain many unique constituents. The flavoring materials are of particular importance and value. The minerals are usually rather high, especially in the leafy vegetables, and are

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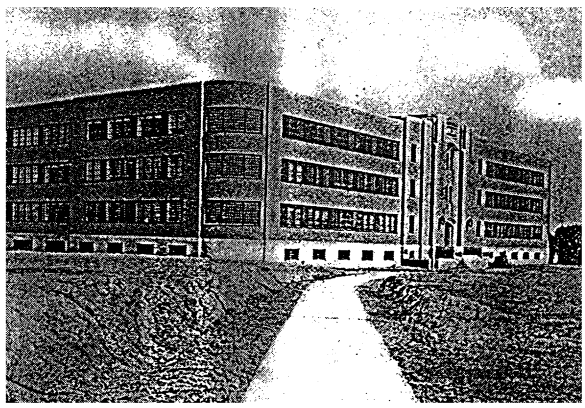

Research Work and Workers

Dr. Frederick P. Weaver, Professor of Agricultural Economics at Pennsylvania State College, died Sept. 5, aged 68.

Dr. Merritt L. Fernald, Director of the Gray Herbarium at Harvard, was presented with the Leidy Medal of the Academy of Natural Sciences of Philadelphia at a reception held Sept. 17 for his "outstanding contributions to the floristics of the eastern part of North America."

Professor C. B. Williams has retired, on reaching the specified age, from active duty as head of the Department of Agronomy, North Carolina State College.

Prof. Martin Nelson, Arkansas College of Agriculture, has retired.

Dr. Wendell Bartholdi has been appointed in charge of vegetable research at Rhode Island A.E.S.

Honey and Pollen Plants of the U.S. is the title of Circular 554 from the U.S.D.A. The lists, arranged by states, are invaluable to beekeepers.

Dr. G. A. Zentmyer, Jr., has been appointed research assistant at the Storrs, Connecticut, station to specialize in investigations of the Dutch elm disease.

An excellent classification of the virus diseases of plants is to be found in the Handbook of Phytopathogenic Viruses by Dr. F. O. Holmes, published by the Burgess Publishing Co., Minneapolis ($2).

After a two-months trip in eastern and midwestern states, Dr. H. A. Gleason has returned to the N. Y. Botannical Garden with some 3,000 plan specimens for the herbarium.

In cabbage trials at Minnesota AES, Golden Acre was first in earliness and second in yield, out of 12 varieties tested. Early Summer was first in yield, but next to last in maturity.

Drs. Moran, Briese and Couch, USDA, have found hydrocyanic acid, enough to be dangerous to livestock, in the wild California almond, two western species of wild flax, the eastern manna grass and a marsh plant known as arrow grass.

Kudzu as an erosion control crop is discussed in Farmers Bulletin 1840, from USDA.

The death has occurred of Mr. W. H. Mason, a Governor of the National Farm Chemurgic Council. A former assistant of Thomas A. Edison, he developed masonite wall boards and plastic materials from what used to be lumber mill wastes.

A new hybrid tea rose, double flowered and crimson red, patented by L. B. Coddington of Summit, N. J., has been named for M. S. Hershey on his 83rd birthday, in recognition of his establishment of the public rose gardens at Hershey, Pa.

German experiments in crossing fiber flax with oil flax plants are reported to have produced a variety which combines the best characteristics of the parent plants, yielding more fiber and more oil.

Texas Chemurgic Industries, Inc., is a new company with capital of $500,000 formed by well-known technicians of Texas for the production of various materials from sweet potatoes and other crops.

The annual Fall meeting of the American Rose Society will be held at the Skirvin Hotel, Oklahoma City, October 20-22.

Patent No. 2,215,136, assigned to the Brown Co., Berlin, N. H., covers the manufacture of a powder from locust tree beans which strengthens paper used in tissues, towels, etc., so that the fibers do not disintegrate when wet.

Dr. Karl C. Hanner has been appointed assistant professor of plant physiology in charge of plant investigations at the U.S. Plant, Soil and Nutrition Laboratory in Cornell University.

Background for Quality

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packers who find Chicago Pickling well adapted for the production of the fruits commonly used for dill pickles.

Improved Long Green and Ferry's Long Green are relatively late black spined varieties especially desirable for general home garden use. These varieties produce long attractive fruits of the best quality for salad use as well as for pickling purposes.

Lemon cucumber is a true black spined cucumber, the fruits of which are lemon yellow and short oval in shape.

Crystal Apple is creamy white, white spined and of short oval shape. Lemon and Crystal Apple are home garden varieties of superb quality.

What to Do About Vegetables

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in available forms. Pectin is abundant in the root vegetable. Carotene, the precursor of vitamin A, is abundant in carrots and in spinach. Riboflavin, vitamin B_2, is also abundant in the leafy vegetables. Chlorophyll in leaves and anthocyanin in beets are noteworthy pigments. Various acids, sugars, amino acids, and enzymes are found in practically all vegetable crops, in some cases in conspicuous amounts. Oils are found in the seeds, waxes in the cuticles, volatile oils in the tissues of the Cruciferae, especially.